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Water use by eucalypt forests

Craig Macfarlane

National Research
FLAGSHIPS
Water for a Healthy Country



Acknowledgements

Mark Adams, Derek Eamus, Nick Ebdon, Andrew Grigg, Roger Meder, Sebastian Pfautsch, Richard Silberstein, Don White

Australian Research Council, Premier's Water Foundation, Alcoa World Alumina Australia, The Water Corporation of WA, The University of Western Australia, The University of Melbourne, The University of New South Wales

How does eucalypt forests vary with aridity?

Hypothesised decrease:

Basal area

Sapwood area

Crown cover

Leaf area index

Sapwood depth

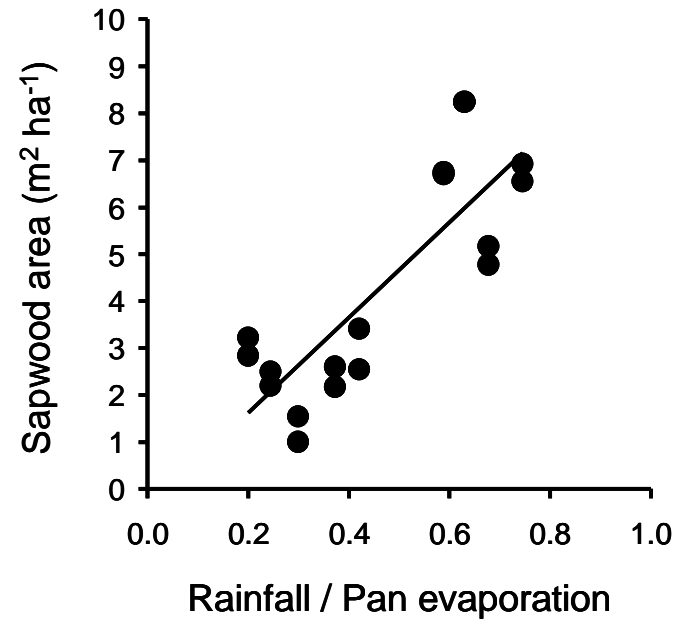
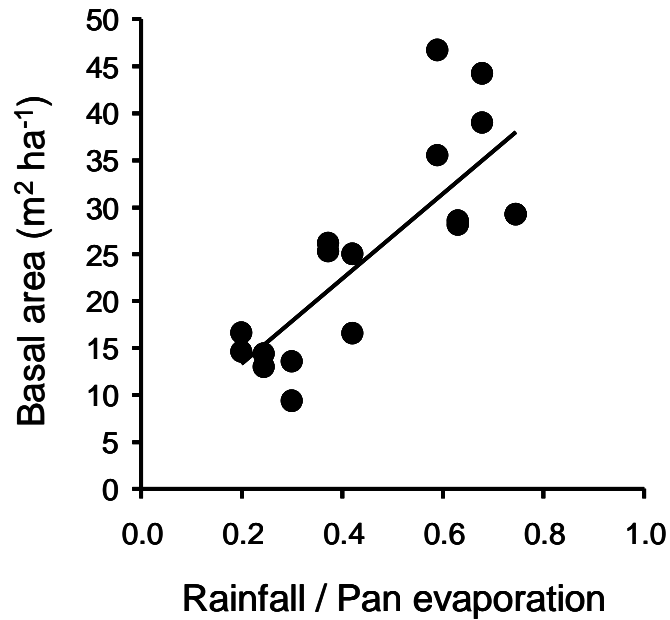
Leaf area to sapwood area ratios

Transpiration rates – sap velocity and per unit LAI water use

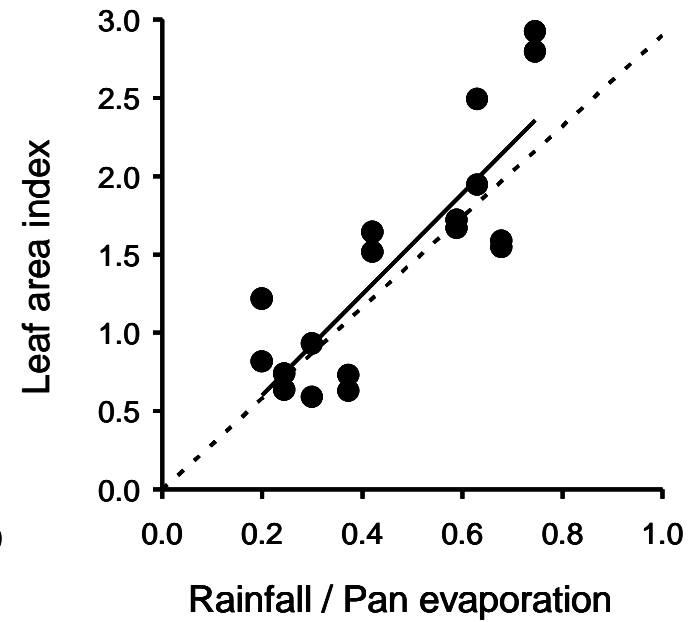
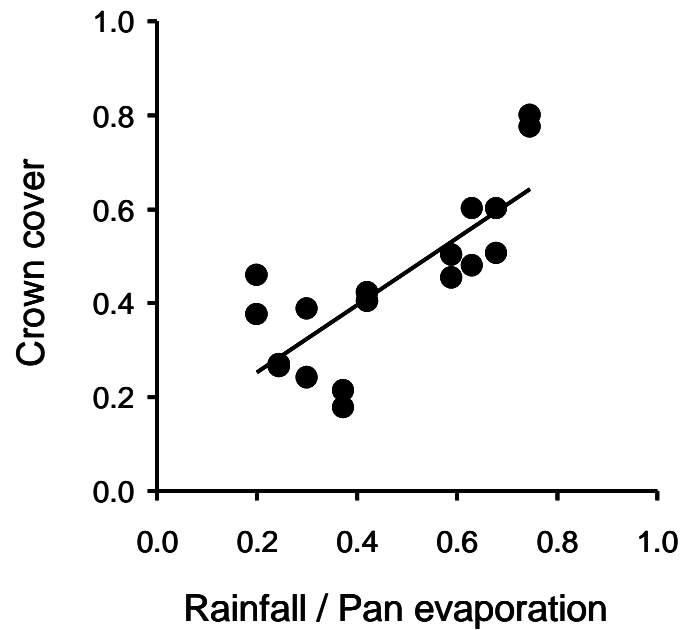
Hypothesised increase:

Sapwood density

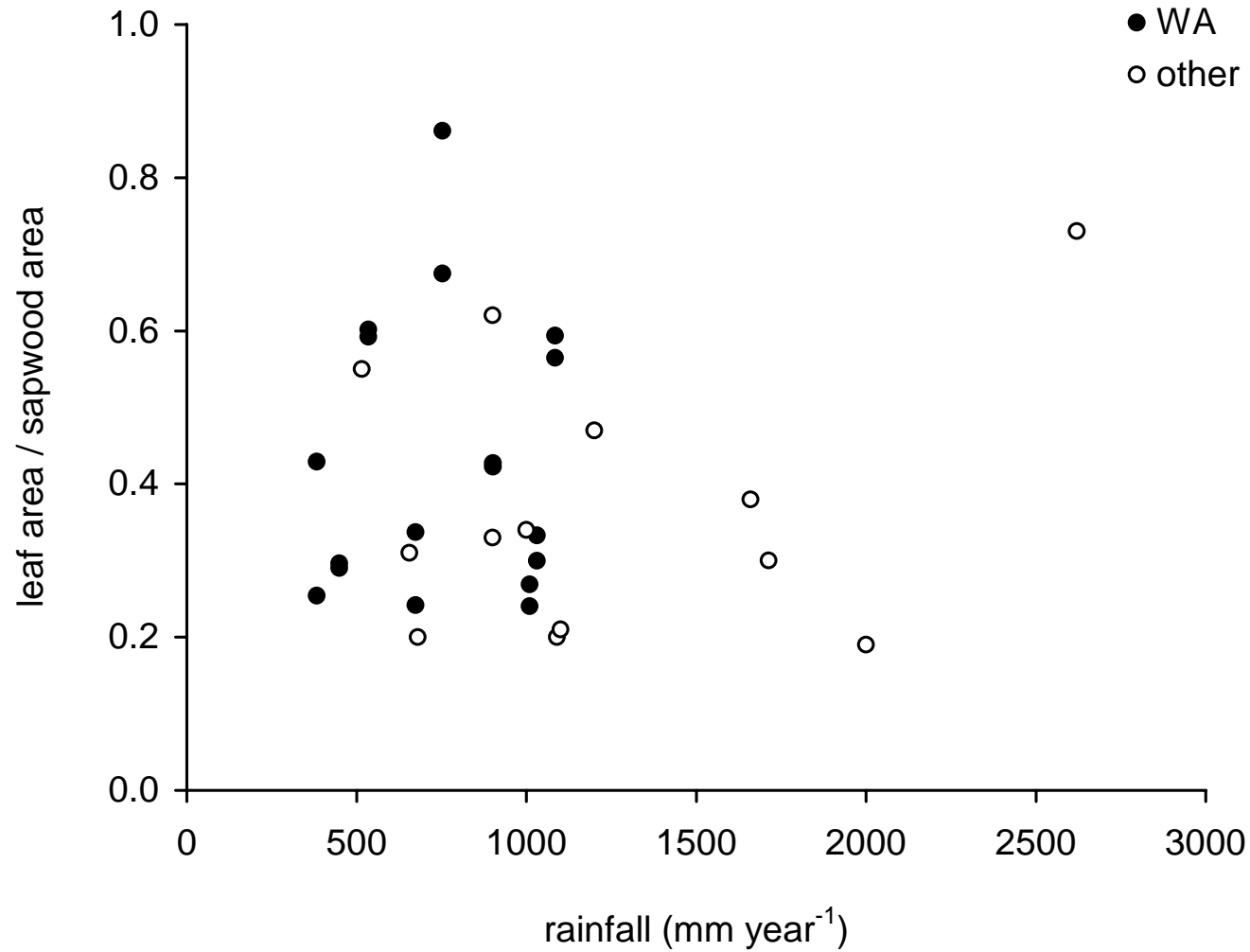
Basal and sapwood area decrease with aridity



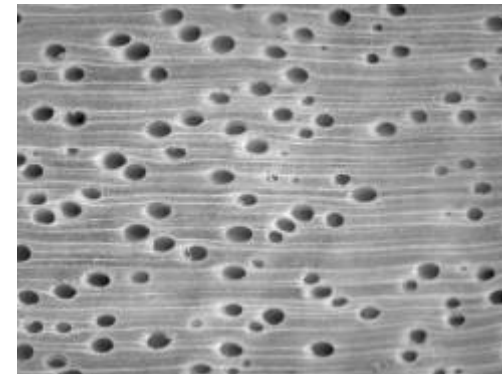
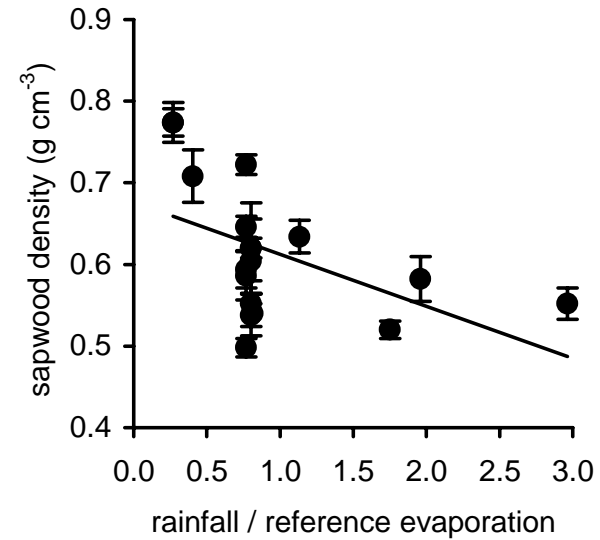
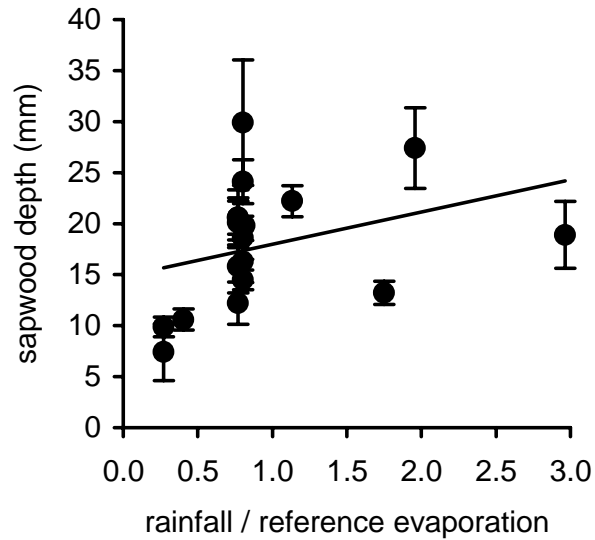
Cover and LAI decrease with aridity



LA/SA not related to aridity



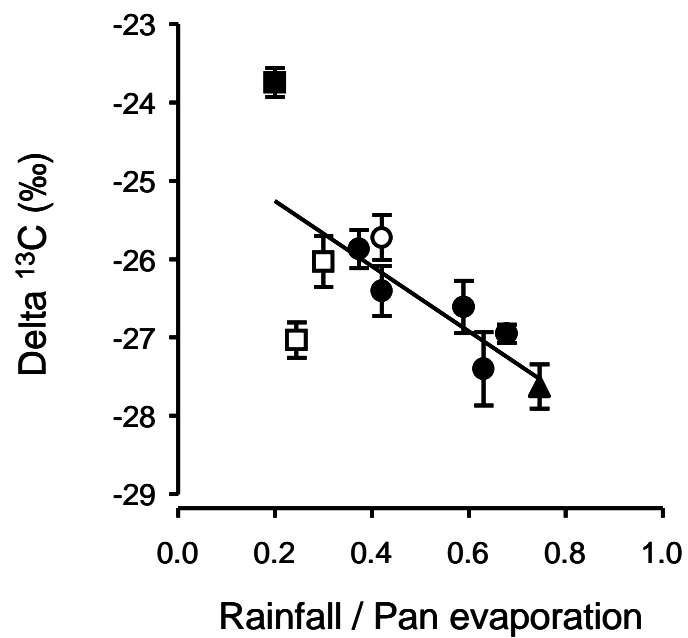
Sapwood density increases with aridity



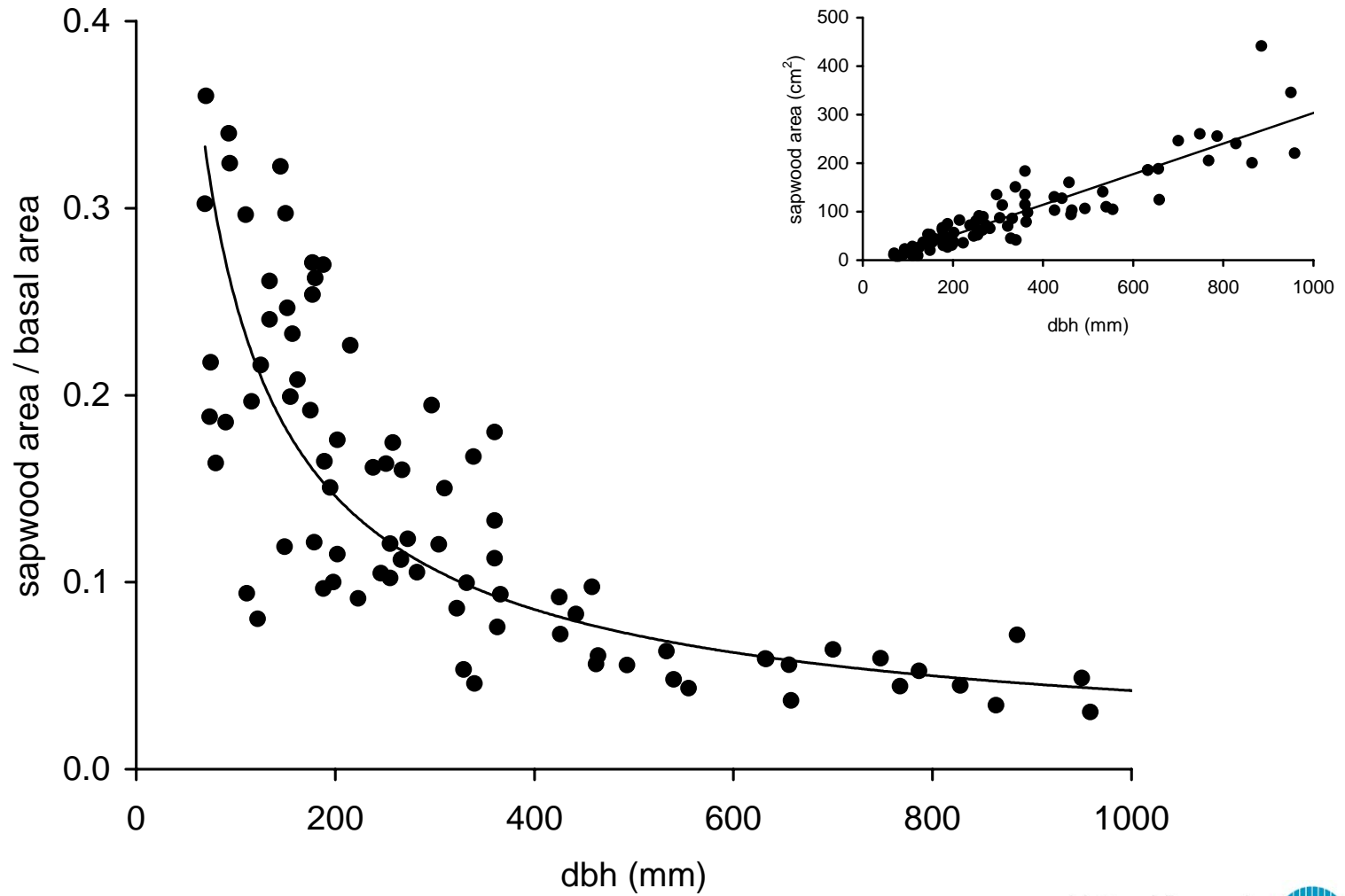
Transpiration rates

species	site	period	mean Vs (cm hr ⁻¹)	m ³ ha ⁻¹ d ⁻¹ LAI ⁻¹
salmon gum	Quairading	annual	6.3	3.3
powderbark wandoo	Wandoo NP	annual	6.8	2.4
jarrah	Gordon (Dwellingup)	annual	5.9	4.8
jarrah	Huntly old-growth	annual	6.4	3.1
jarrah	Huntly regrowth	annual	7.5	4.7
jarrah	Lewis ex-mined	Oct-July	5.2	6.7
jarrah	Bates regrowth	Oct-July	5.0	5.8

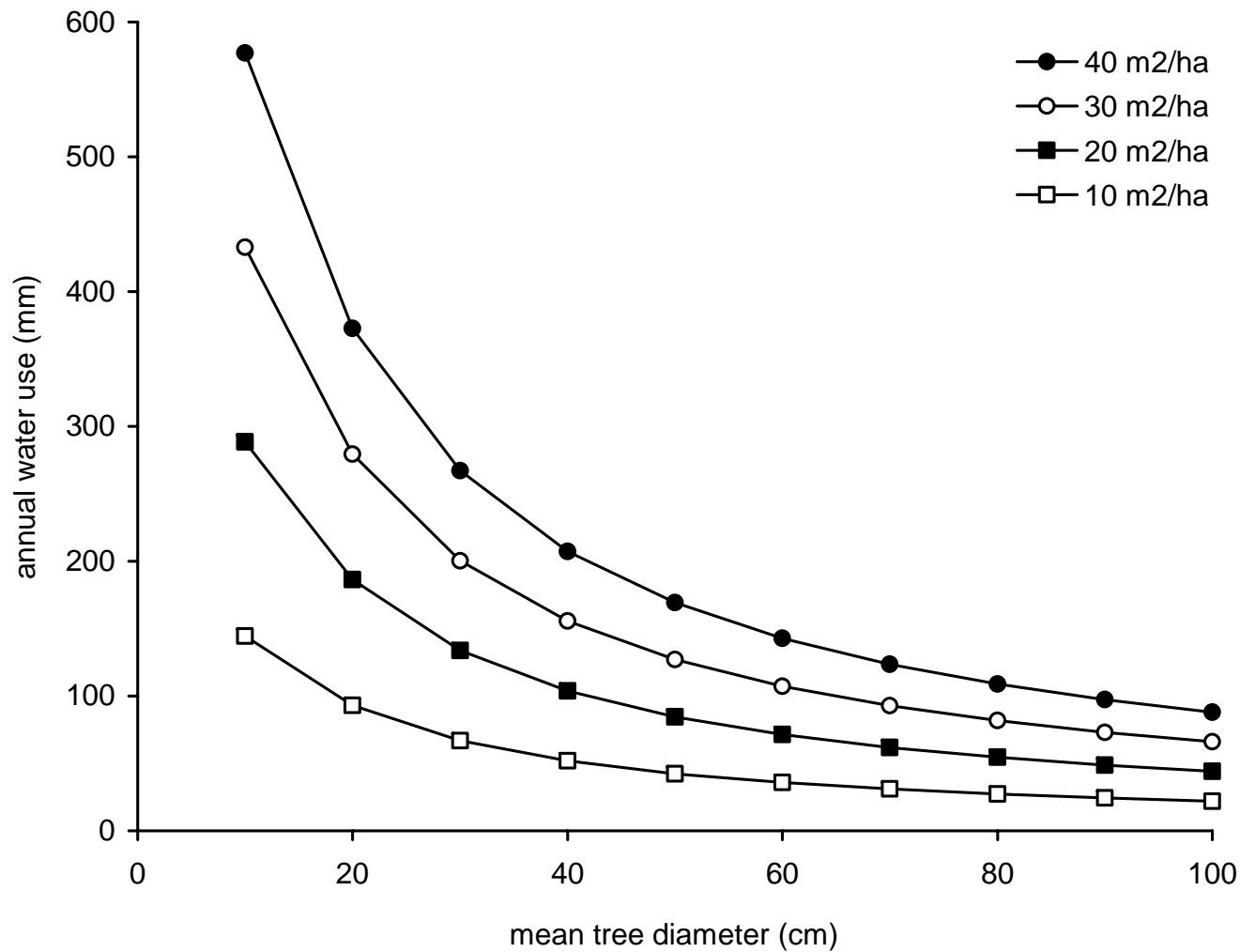
$\delta^{13}\text{C}$ decreases with aridity



SA/BA variation depends on tree size



Simulated water use of jarrah forest



Conclusions

More arid regions = fewer, smaller trees and less: basal area, sapwood area, cover and LAI.

Sap velocity not related to aridity but leaf conductance is probably smaller. Higher LA/SA?

Modifying forest structure can reduce overstorey water use more than basal area reduction alone.